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CLAIMS

[Claim(s)]

[Claim 1] Between the equipment of the transmitting side which has the case which carried out mutually-independent, and the equipment of a receiving side The 1st and 2nd exchangeable record medium with which management information, such as a record location of the data, was recorded with a series of data, such as an image and voice, is used. A series of data currently recorded on the 1st record medium set in the equipment of said transmitting side It is the system [MUBU / system / the 2nd record medium set in the equipment of said receiving side]. The equipment of said transmitting side When normal transfer processing is performed with the 1st storage means which memorizes temporarily the management information currently beforehand recorded on said 1st record medium before carrying out MUBU processing of the data An elimination means to eliminate the management information about a series of data which it finished sending [from] among all the original management information of said 1st record medium, and when normal transfer processing is not performed While it has the 1st return means which returns the management information before the MUBU processing previously memorized for said 1st storage means to said 1st record medium, the equipment of said receiving side When normal transfer processing is performed with the 2nd storage means which memorizes temporarily said management information currently beforehand recorded on said 2nd record medium before carrying out MUBU processing of the data An additional means to add the management information about a series of data received to the management information of the data of the origin currently recorded on said 2nd record medium, and when normal transfer processing is not performed The datum aconite tuber stem characterized by having the 2nd return means which returns the management information before the MUBU processing previously memorized for said 2nd storage means to said 2nd record medium.

[Claim 2] It is the datum aconite tuber stem characterized by what is been what transmits the management information which the said 1st and 2nd storage means has [both] the memory of a non-volatile, and is recorded on the power up on said record medium to said nonvolatile memory in a datum aconite tuber stem according to claim 1, and memorizes.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates between the record regenerative apparatus which use a disk etc. as a record medium to the datum aconite tuber stem which performs MUBU of data through a digital interface.

[0002]

[Description of the Prior Art] In recent years, the equipment which encodes and carries out the digital storage of a video signal or the music signal is put in practical use with the advance of digital technique. With these equipments, since the record playback of the signal can be carried out, fixed constraint is prepared in high definition about the duplicate.

[0003] it is for example, like [in the case of a music signal] a mini disc (it is hereafter described as MD) for the music signal which has the copyright recorded on the compact disc (it is hereafter described as CD) according to the structure called a serial copy management system (SCMS) — digital dubbing of the music signal which recorded carrying out digital dubbing to 7s record media with the analog source to one generation is allowed only within respectively private use to two generations.

[0004] However, since it is not regarded as a copy, moving a music signal to another media from a certain media does not have a limit of a count, and it is allowed as a practice.

[0005] Migration between the media of this music signal is realized by eliminating the music signal copied from the media of a copied material on the occasion of a copy. This is called MUBU.

[0006] With such a record regenerative apparatus, the device in which a copy and MUBU are possible is commercialized similarly. For example, there is a record regenerative apparatus like JP,4-258834,A.

[0007] The configuration of the equipment in the case of performing signal MUBU in equipment such conventionally is explained still more concretely.

[0008] Drawing 9 is the block diagram of the conventional equipment [MUBU / between MD (only henceforth a disk) as a record medium / equipment / a signal].

[0009] Although this equipment usually puts side by side the unit of the pair which has the same function in which record playback is possible into one case in many cases, here In order to make an understanding easy, one unit U1 considers as the side from which the unit U2 of another side receives a signal by the side which sends out a signal, the unit U1 of a transmitting side shall have a regenerative function, and the unit U2 of a receiving side shall mainly have a record function.

[0010] First, the configuration of the unit U1 of a transmitting side (playback side) is explained.

[0011] 83 is the servo section. While the roll control signal S801 performs a roll control so that a disk 81 may carry out predetermined rotation, the position control signal S802 performs position control so that a head 82 can read desired data.

[0012] 84 is the error correction section. It restores to the regenerative signal S803 reproduced from the head 82, detection and correction of an error are performed using the correction sign beforehand added at the time of record, and the coded signal S804 after correction is outputted.

[0013] 85 is memory. A coded signal S804 is memorized temporarily, and when required, the storage coded signal S805 is outputted. In the case of MD, a digitized voice signal is compressed into the amount of information of 5 about 1/per frame of 512 samples / channel, and is encoded. However, the about 5X signal rate of the storage coded signal S805 required for the decryption section 6 is in a coded signal S804, and it is reproduced at a rate. For this reason, 5 [about 1-/] comes out comparatively, and a coded signal S804 reads intermittently as it will rest for 8 seconds next, if reproduced for 2 seconds. The difference between the signal rate of a coded signal S804 and the signal rate of the storage coded signal S805 is absorbed by this memory 5.

[0014] 86 is the decryption section. The storage coded signal S805 is decrypted and a sound signal S806 is outputted out of a case.

[0015] Next, the configuration of the unit U2 of a receiving side (record side) is explained.

[0016] 87 is the coding section. Compression coding of the sound signal S807 inputted from the case outside is carried out about 1/per frame of 512 samples / channel at the amount of information of 5, and a coded signal

S808 is outputted.

[0017] 88 is memory. A coded signal S808 is memorized temporarily, and when required, the storage coded signal S809 is outputted. The difference between the signal rate of a coded signal S808 and the signal rate of the storage coded signal S809 is absorbed by this memory 88. The record playback rate of a disk is set as a rate quicker than the signal rate of a coded signal S808. In this case, as for memory 88, the direction of the rate of an output becomes high. Therefore, according to the amount of data currently held, intermittent record is performed as it will record, if the data of a certain constant rate accumulate in memory 88. Seeking etc. is processed in this idle time.

[0018] 89 is a correction sign adjunct. It becomes irregular by adding a correction sign to the storage coded signal S809, and the record signal S810 is outputted.

[0019] 93 is the servo section. While the roll control signal S811 performs a roll control so that a disk 91 may carry out predetermined rotation, the position control signal S812 performs position control so that a head 92 can record data.

[0020] 95 is a switch. When performing a copy and MUBU from MD by the side of delivery to MD by the side of a receptacle, a switch 95 can be turned on, can bypass the decryption section 86 and the coding section 87, and can input the storage coded signal S805 into memory 88 as a coded signal S808 directly. This loses degradation of the signal grace by repressing, and still more nearly high-speed MUBU becomes possible.

[0021] 94 is the system control section. Playback and record are controlled by the delivery side control signal S813 and the receptacle side control signal S814 to MD unit by the side of delivery, and MD unit by the side of a receptacle, respectively. In performing MUBU, it connects a switch 95 with the by-pass control signal S815.

[0022] Next, the DS of each disks 81 and 91 is explained with reference to drawing 10. In addition, although only one disk 81 is explained here, the same is fundamentally said of the structure of the disk 91 of another side.

[0023] The field for recording the management information of data called TOC (table OBU contents) and the data area where data, such as a music signal, are recorded are secured to the disk 81. In addition, this example shows the case where five data (for example, music program of five music) are recorded on the disk 81.

[0024] According to the number of the data currently recorded on the data area, for every data, 1 set of a total of five management information currently recorded on the TOC field exists at a time, and is written in based on the regulation beforehand decided in an order from the head. Each management information has also managed accompanying information, such as positional information of on which area of a data area actual data are recorded, a title, and copyright information, to coincidence. The positional information of on which area of a data area actual data are recorded is managed in order by TNO (truck number), and from TNO1 to TNO5 exists in this example.

[0025] On the other hand, each data memorized in the data area may be divided and recorded, without a field continuing, even if it is data of one TNO, although it is not further illustrated when it has not necessarily stood in a line in an order from TNO1, and sequence is changed and there is a non-record section (part which drew the slash among drawing) the middle like TNO3. These can all be managed now by the management information in a TOC field.

[0026] Next, the conventional procedure of performing MUBU between the disk 81 equipped with DS like drawing 10 and 82 is explained with reference to drawing 11 using equipment equipped with the configuration shown in drawing 9.

[0027] Drawing 11 (a) is an example of the DS of each disks 81 and 91 set to both the units U1 and U2 before performing MUBU, and drawing 11 (b) is an example of the DS of each disks 81 and 91 after performing MUBU.

[0028] Here, two data shall already be recorded on the disk 91 set to the unit U2 of the receiving side before recording five data on the disk 81 set to the unit U1 of the transmitting side before performing MUBU like the example previously explained by drawing 10 and performing MUBU in order.

[0029] In this condition, the case, MUBU [the data D of TNO4 currently recorded on the disk 81 of a transmitting side], is taken for an example, and that actuation is explained.

[0030] First, the data D of TNO4 of the disk 81 of a transmitting side are copied to the empty area of the data area of the disk 91 of a receiving side.

[0031] When record of this data D of TNO4 is completed normally, the management information of TNO3 which shows the field of Data D to the TOC field of the disk 91 of a receiving side is added. Then, in the disk 81 of a transmitting side, after deleting the management information of TNO4 in a TOC field, the contents of the management information of TNO5 which suited the bottom of it are moved to the management information area of TNO4.

[0032] Although MUBU is completed above, as the DS of the disk 81 of the transmitting side after MUBU completion is shown in drawing 11 (b), the management information of TNO4 is deleted from a TOC field, instead the contents of TNO5 are written to the management information area of TNO4. Since TNO on which it is recorded in the TOC field although the stereo remains as it is since the management information which had managed this area was deleted becomes unknown, Data D are treated as a non-record section after all.

[0033] The management information of TNO4 which the data D of TNO4 which suited the disk 81 of a transmitting side were recorded on the data area as TNO3, and was in the TOC field to the TOC field of the disk 81 of a transmitting side about the disk 91 of the receiving side after MUBU completion on the other hand is newly added as management information of TNO3.

[0034]

[Problem(s) to be Solved by the Invention] Thus, conventionally, MUBU is possible only with the equipment in one case with which the one system control section 94 can manage a delivery and receptacle side, and MUBU between the equipment of a separate case was not able to be performed certainly.

[0035] That is, when MUBU was performed between equipment with a separate case, there was a problem that, and will remain copied after all not MUBU but, or the data under migration will be lost if the situation of the power source of one side being disconnected occurs. [that connection is removed before eliminating the management information of a transmitting side immediately after a copy of data]

[0036] This invention solves such a conventional trouble, and even if it is between isolated systems mutually, it makes a technical problem the thing whose cases differ and for which it enables it to perform MUBU certainly.

[0037]

[Means for Solving the Problem] mutually-independent in this invention, in order to solve this technical problem — between the equipment of the transmitting side which has a case the bottom, and the equipment of a receiving side The 1st and 2nd exchangeable record medium with which management information, such as a record location of the data, was recorded with a series of data, such as an image and voice, is used. A series of data currently recorded on the 1st record medium set in the equipment of said transmitting side are performed as follows in the system [MUBU / system / the 2nd record medium set in the equipment of said receiving side].

[0038] The 1st storage means which memorizes temporarily the management information currently beforehand recorded on said 1st record medium in the 1st invention before the equipment of a transmitting side carries out MUBU processing of the data. An elimination means to eliminate the management information about a series of data which it finished sending [from] among all the original management information of said 1st record medium when normal transfer processing is performed. When normal transfer processing is not performed, while it has the 1st return means which returns the management information before the MUBU processing previously memorized for said 1st storage means to said 1st record medium The 2nd storage means which memorizes temporarily said management information currently beforehand recorded on said 2nd record medium before the equipment of said receiving side carries out MUBU processing of the data. An additional means to add the management information about a series of data received to the management information of the data of the origin currently recorded on said 2nd record medium when normal transfer processing was performed. When normal transfer processing was not performed, it considered as the configuration equipped with the 2nd return means which returns the management information before the MUBU processing previously memorized for said 2nd storage means to said 2nd record medium.

[0039] By this, when performing MUBU between isolated systems, in each equipment of a transmitting side and a receiving side, the management information of a storage is temporarily memorized in memory, and when processing is not completed normally, the management information temporarily memorized to the storage is returned to a record medium. This can perform MUBU between isolated systems certainly mutually.

[0040] Moreover, in the 2nd invention, the 1st and 2nd storage means is characterized [both] by being what transmits and memorizes the management information which has the memory of a non-volatile and is recorded on the power up on said record medium to said nonvolatile memory in the 1st configuration of invention.

[0041] When MUBU is performed between isolated systems, the management information of each storage is temporarily memorized to nonvolatile memory in each equipment of a transmitting side and a receiving side and processing is normally completed during MUBU processing by this, the contents of the management information memorized to nonvolatile memory, respectively at the time of MUBU processing termination are made into an invalid. On the other hand, during MUBU processing, by cutting of a power source, when processing is not completed normally, the management information memorized to the nonvolatile memory of each equipment is returned and rewritten to a record medium at the power up of the equipment of a degree. This can perform MUBU between isolated systems certainly mutually.

[0042]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained, referring to a drawing.

[0043] The datum aconite tuber stem of the 1st invention between the equipment of the transmitting side which has the case which carried out mutually-independent, and the equipment of a receiving side The 1st and 2nd exchangeable record medium with which management information, such as a record location of the data, was recorded with a series of data, such as an image and voice, is used. A series of data currently recorded on the 1st record medium set in the equipment of said transmitting side It is the system [MUBU / system / the 2nd

record medium set in the equipment of said receiving side]. The equipment of said transmitting side When normal transfer processing is performed with the 1st storage means which memorizes temporarily the management information currently beforehand recorded on said 1st record medium before carrying out MUBU processing of the data An elimination means to eliminate the management information about a series of data which it finished sending [from] among all the original management information of said 1st record medium, and when normal transfer processing is not performed While it has the 1st return means which returns the management information before the MUBU processing previously memorized for said 1st storage means to said 1st record medium, the equipment of said receiving side When normal transfer processing is performed with the 2nd storage means which memorizes temporarily said management information currently beforehand recorded on said 2nd record medium before carrying out MUBU processing of the data An additional means to add the management information about a series of data received to the management information of the data of the origin currently recorded on said 2nd record medium, and when normal transfer processing is not performed It has the 2nd return means which returns the management information before the MUBU processing previously memorized for said 2nd storage means to said 2nd record medium.

[0044] The datum aconite tuber stem of the 2nd invention transmits and memorizes the management information which the 1st and 2nd storage means has [both] the memory of a non-volatile, and is recorded on the power up on said record medium to said nonvolatile memory in the 1st configuration of invention.

[0045] Hereafter, the gestalt of concrete operation of this invention is further explained to a detail.

(Gestalt 1 of operation) Drawing 1 is the block diagram of the datum aconite tuber stem in the gestalt 1 of operation of this invention. In addition, it explains taking the case of the case where MD is used as a record medium here.

[0046] This datum aconite tuber stem is mutually connected through the digital data bus [like IEEE1394] (only henceforth a bus) 17 whose two isolated systems P1 and P2 are.

[0047] in addition, each equipments P1 and P2 — in practice — the inside of one case — record — here, although the unit of the pair which has the same refreshable function is put side by side in many cases In order to make an understanding easy, one equipment P1 shall be equipped only with the unit of the side which sends out a signal, the equipment P2 of another side shall be equipped only with the unit of the side which receives a signal, the unit of a transmitting side shall have a regenerative function and the unit of a receiving side shall mainly have a record function.

[0048] Moreover, although the data based on an isochronous transfer and the command by asynchronous transfer can pour the bus 17 actually used in the direction of arbitration by time sharing according to a transfer packet format on one signal line, on account of explanation, by drawing 1 , it is a thick wire about the data flow by isochronous transfer, and shows the command stream by asynchronous transfer with the thin line, respectively.

[0049] Next, the configuration of the equipment P1 of a transmitting side (playback side) is explained.

[0050] As for a disk and 2, 1 is [a head and 3] the servo sections. While the roll control signal S101 performs a roll control so that a disk 1 may carry out predetermined rotation, the position control signal S102 performs position control so that a head 2 can read desired data.

[0051] 4 is the error correction section. It restores to the regenerative signal S103 reproduced from the head 2, detection and correction of an error are performed using the correction sign beforehand added at the time of record, and the coded signal S104 after correction is outputted.

[0052] 5 is memory. A coded signal S104 is memorized temporarily, and when required, the storage coded signal S105 is outputted. In the case of MD, a digitized voice signal is compressed into the amount of information of 5 about 1/per frame of 512 samples / channel, and is encoded.

[0053] However, the about 5X signal rate of the storage coded signal S105 required for the decryption section 6 is in a coded signal S105, and it is reproduced at a rate. For this reason, 5 [about 1-/] comes out comparatively, and a coded signal S104 reads intermittently as it rests for 8 seconds, after reproducing for 2 seconds. The difference between the signal rate of a coded signal S104 and the signal rate of the storage coded signal S105 is absorbed by this memory 5.

[0054] 6 is the decryption section. The storage coded signal S105 is decrypted and a sound signal S106 is outputted.

[0055] 15 is the digital interface section like IEEE1394. When performing dubbing and MUBU to the disk 12 of the equipment P2 by the side of a receptacle from the disk 1 of the equipment P1 by the side of delivery, the decryption section 6 can be bypassed and the storage coded signal S105 can be directly outputted to a bus 17 as a digital interface signal S115.

[0056] 13 is the system control section. This system control section 13 is equipped with internal memories (not shown), such as RAM, and controls the equipment P1 by the side of delivery by the control signal S113. To the digital interface section 15, control for performing transmission and reception of an external device and a command through the digital interface signal S115 is also performed.

[0057] Next, the configuration of the equipment P2 of a receiving side (record side) is explained.

[0058] 7 is the coding section. Compression coding of the sound signal S107 is carried out about 1/ per frame of 512 samples / channel at the amount of information of 5, and a coded signal S108 is outputted.

[0059] 8 is memory. A coded signal S108 is memorized temporarily, and when required, the storage coded signal S109 is outputted. The difference between the signal rate of a coded signal S108 and the signal rate of the storage coded signal S109 is absorbed by this memory 8.

[0060] The record playback rate of a disk 12 is set as a rate quicker than the signal rate of a coded signal S108. In this case, as for memory 8, the direction of the rate of an output becomes high. Therefore, according to the amount of data currently held, intermittent record is performed as it will record, if the data of a certain constant rate accumulate in memory 8. Seeking etc. is processed in this idle time.

[0061] 9 is a correction sign adjunct. It becomes irregular by adding a correction sign to the storage coded signal S109, and the record signal S110 is outputted.

[0062] 10 is the servo section. While the roll control signal S111 performs a roll control so that a disk 12 may carry out predetermined rotation, the position control signal S112 performs position control so that a head 11 can record data.

[0063] 16 is the digital interface section like IEEE1394. When performing a copy and MUBU to the disk 12 of the equipment P2 by the side of a receptacle from the disk 1 of the equipment P1 by the side of delivery, the coding section 7 can be bypassed and the coded signal which received from the digital interface signal S115 can be directly inputted into memory 8. Degradation of the signal grace by repressing can be lost by this, and while it has been compressed data, in order to transmit, high-speed MUBU becomes possible.

[0064] 14 is the system control section. This system control section 14 is equipped with internal memories (not shown), such as RAM, and controls the equipment P2 by the side of a receptacle by the control signal S114. Moreover, to the digital interface section 16, control for performing transmission and reception of an external device and a command through the digital interface signal S115 is also performed.

[0065] In addition, since the DS of each disks 1 and 12 is the same as the case where drawing 9 explains, explanation is omitted.

[0066] Drawing 2 is the flow chart of the main program of the system control sections 13 and 14 in each equipments P1 and P2 of a transmitting side and a receiving side.

[0067] Initial setting of a device is performed after powering on (S21), and it moves to the Main processing (S22). In the Main processing, it has the structure of starting each routine, according to the command from the panel switch and IEEE1394 of a device. Here, explanation of processing of these each is omitted.

[0068] The flow chart of MUBU processing [in / in drawing 3 (a) / the equipment P1 of a transmitting side] and drawing 3 (b) are the flow charts of the MUBU processing in the equipment P2 of a receiving side. Moreover, drawing 4 is drawing for explaining the interrelation at the time of the MUBU processing in both the equipments P1 and P2, and the arrow head shows the exchange of the equipment P1 by the digital interface, and the command between P2. Drawing showing an example of the DS of the disks 1 and 12 set in both the equipments P1 and P2 before drawing 5 (a) performs MUBU, Drawing for drawing 5 (b) to explain the DS of both the disks P1 and P2 immediately after data transfer, Drawing for drawing 6 (a) to explain the DS of both the disks 1 and 12 after completing MUBU normally, and drawing 6 (b) are drawings for explaining the DS of both the disks 1 and 12 after terminating MUBU abnormally.

[0069] In addition, each means in a claim is realized by the software based on the flow chart shown in the system control sections 13 and 14, drawing 2, and drawing 3 of each equipments P1 and P2.

[0070] Next, the actuation in the case of performing MUBU processing between a disk 1 and 12 is explained, referring to these drawing 3 thru/or drawing 6.

[0071] Here, two data shall already be recorded on the disk 12 of the receiving side before recording five data on the disk 1 of the transmitting side before performing MUBU like the example previously shown in drawing 11 and performing MUBU in order.

[0072] In this condition, it explains taking the case of the case, MUBU [the data D of TNO4 currently recorded on the disk 1 of a transmitting side].

[0073] When starting MUBU, as shown in drawing 3, the equipment P1 of a transmitting side performs the notice of connection to the equipment P2 of a receiving side (S301). According to this, the equipment P2 of a receiving side performs the notice check of connection (S313), and performs the notice of a preparation completion (S314). By this, connection by the digital interface between two equipments P1 and P2 is established.

[0074] As each equipments P1 and P2 of a transmitting side and a receiving side are shown in drawing 5 (a), respectively, all management information in the TOC field of disks 1 and 12 is memorized (S303, S315). Storage of the management information of this TOC field is performed using the internal memory with which each system control sections 13 and 14 are equipped and which is not illustrated.

[0075] The equipment P1 of a transmitting side outputs the data D of TNO4 as a digital interface signal S115 (S304). The equipment P2 of a receiving side inputs the digital interface signal S115, and it records on the empty

area in the data area of a disk 12 (S316). Therefore, as shown in drawing 5 (b), at the time immediately after a transfer, both the data D of TNO4 exist on both the disks 1 of a transmitting side and a receiving side, and 12. [0076] When a transfer of Data D is completed, the equipment P1 of a transmitting side performs the notice of transfer termination (S305). After the equipment P2 by the side of a receptacle checks normal reception (S317), it performs the transmitting termination check sent from the equipment P1 of a transmitting side (S318), and performs the notice of the completion of reception (S319). Thus, when the equipment P1 of a transmitting side performs the completion check of reception (S306), both equipments P1 and P2 can check, respectively that the data transfer has been normally completed from the equipment P1 of a transmitting side to the equipment P2 by the side of a receptacle.

[0077] The equipment P1 of a transmitting side starts the timer set as sufficient predetermined time T1 for rewriting of the management information in a TOC field (S307).

[0078] And during the period T1 until a timer passes the deadline of, the management information about the data D in the TOC field of a disk 1 is eliminated, and the management information of TNO5 is moved to the area of the management information of TNO4 (S308).

[0079] Subsequently, when it checks whether elimination of management information had been completed normally (S309) and completes normally, the notice of the completion of elimination is performed to the equipment P2 of a receiving side (S310).

[0080] Then, by the time it passes the deadline of, when it confirmed whether the notice of additional completion was received from the equipment P2 of a receiving side (S311), and a notice comes, MUBU processing is ended normally as it is.

[0081] In addition, in this case, as shown in drawing 6 (a), the data D of TNO4 remain in the data area of the disk 1 of the equipment P1 of a transmitting side as it is, but since the management information about the data D in that TOC field is eliminated, it is treated only with a non-record section and Data D cannot be taken out.

[0082] On the other hand, the case where establishment of the digital interface connection at the time of MUBU initiation cannot be performed in the equipment P1 of a transmitting side, When elimination of the management information of a disk 1 is not completed normally, or when the notice of additional completion does not come from the equipment P2 of a receiving side even if predetermined time T1 passes and a timer passes the deadline of It considers that all are unusual and the management information memorized to the internal memory of the system control section 13 in previous step 303 is returned to the TOC field of a disk 1 as it is (S312).

[0083] On the other hand, the equipment P2 of a receiving side starts the timer of sufficient predetermined time T2 for rewriting of TOC as well as the equipment P1 of a transmitting side (S320).

[0084] And the management information about the data D which are in the TOC field of a disk 12 during the period T2 until a timer passes the deadline of is added (S321).

[0085] Subsequently, when it checks whether the addition of management information had been completed normally (S322) and an addition is completed normally, additional completion is notified to the equipment P1 of a transmitting side (S323).

[0086] Then, by the time it passes the deadline of, when it confirmed whether the notice of the completion of elimination was received from the equipment P1 of a transmitting side (S324), and a notice comes, MUBU processing is ended normally as it is.

[0087] On the other hand, the case where establishment of the digital interface connection at the time of MUBU initiation cannot be performed in the equipment P2 of a receiving side, Even if the case where all data cannot be correctly copied by the write error to a disk 12 etc. at the time of a copy of data, and predetermined time T2 pass and a timer passes the deadline of When [all] the notice of the completion of elimination does not come from the equipment P1 of a transmitting side, it is considered that it is unusual and the management information memorized to the internal memory of the system control section 14 in previous step 315 is returned to the TOC field of a disk 12 as it is (S325).

[0088] Thus, when it is judged that it is unusual and MUBU processing is completed, as shown in drawing 6 (b), on the disk 12 of the equipment P2 of a receiving side, the data D of already copied TNO4 will remain as it is, but since the management information about the data D in a TOC field is eliminated, it is treated only with a non-record section and cannot take out Data D.

[0089] In addition, although the above processing explained that each notice through a digital interface was notified only when each processing is completed normally, it is easy to be natural even if it notifies having terminated abnormally when each step was not completed normally.

[0090] thus, the case where MUBU is performed between an isolated system P1 and P2 through the bus 17 which can transmit a command and signal data — each equipments P1 and P — after memorizing the management information of disks 1 and 12 temporarily to internal memories, such as the system control sections 13 and 14, for every two, signal data are copied to the equipment P2 of a receiving side from the equipment P1 of a transmitting side. And when MUBU processing is not normally completed in predetermined time T1 and T2, this management information memorized temporarily is returned to the TOC field of disks 1 and 12 as it is. If it

does in this way, a problem on which it will remain being in the condition that data were copied by making suddenly connection of both the equipments P1 and P1 before eliminating the management information of the equipment P1 of the transmitting side just behind a copy of data, or the data under migration will be lost does not occur, but MUBU can be performed certainly.

[0091] (Gestalt 2 of operation) The gestalt 2 of operation of this invention is explained below.

[0092] The description of the gestalt 2 of this operation is using nonvolatile memory, such as EEPROM which does not disappear as an internal memory used in order to memorize temporarily the management information in the TOC field of disks 1 and 12 even if it drops a power source, in each system control sections 13 and 14 in each equipments P1 and P2 of a transmitting side and a receiving side.

[0093] Drawing 7 is the flow chart of the main program of the system control section of a transmitting side and a receiving side.

[0094] Initial setting of a device is performed after powering on (S21), and it checks whether the disk 1 is set (S61). When the disk 1 is set, it checks whether the management information memorized by the nonvolatile memory of the system control section 13 is effective (S62). In the middle of a power source, by cutting, when MUBU processing does not have a line crack to the last, the management information memorized by nonvolatile memory becomes effective. The judgment of the effective invalid in this case is performed by preparing the flag for judging an effective invalid for nonvolatile memory. Or the parity check bit of the data in nonvolatile memory etc. is prepared, and it may be made to judge effectiveness.

[0095] If the management information memorized by nonvolatile memory is effective, this information will be read and it will replace with the management information in the TOC field of a disk (S63). If not effective, nothing will be done but it will shift to the Main processing (S22).

[0096] In this Main processing S22, it has the structure of starting each routine, according to the command from the panel switch and bus 17 of a device. Explanation of processing of these each is omitted.

[0097] Drawing 8 (a) is the flow chart of MUBU processing of the equipment P1 of a transmitting side, and drawing 8 (b) is the flow chart of MUBU processing of the equipment P2 of a receiving side.

[0098] The actuation except the processing (S701, S702) which initializes the management information memorized by nonvolatile memory just before the end being added is completely the same as the case of the flow chart shown in drawing 3.

[0099] When MUBU processing is completed to normal to the last the management information memorized by nonvolatile memory initializes — having (S701, S702) — a power source — on the way — by cutting etc., when MUBU processing does not have a line crack to the last Since it remains while the management information memorized by nonvolatile memory has not been initialized, and the information becomes effective, it operates so that the management information in the TOC field of disks 1 and 12 may be restored to a next power up.

[0100] As mentioned above, also in the gestalt 2 of this operation, the management information of each disk 1 and 12 of a transmitting side and a receiving side is temporarily memorized to nonvolatile memory, signal data are copied to a receiving side from a transmitting side, the management information of each disk 1 and 12 is updated, and it notifies having terminated normally within fixed time amount, respectively to a partner's equipments P1 and P2. When processing is not normally completed during MUBU processing, the management information of disks 1 and 12 is returned to the management information temporarily memorized to nonvolatile memory.

[0101] When MUBU processing is completed normally, the contents of nonvolatile memory are initialized, respectively and it is made an invalid. Before eliminating the management information of the transmitting side just behind a copy of data by MUBU [with such an approach], a problem on which connection will be removed, or a copy which infringes on copyright will be made even if cutting of the power source of one side etc. occurs especially, or the data under migration will be lost does not occur, but MUBU can be performed certainly.

[0102]

[Effect of the Invention] As for this invention, the following effectiveness is acquired.

(1) When performing MUBU between two equipments which carried out mutually-independent, by removing connection, before eliminating the management information of the transmitting side just behind a copy of data, or dropping only the power source of one side, a problem on which a copy will be made or the data under migration will be lost does not occur, but MUBU can be performed certainly.

(2) Moreover, since MUBU is realizable by preparing two equipments of a general configuration of having had one signal record playback unit in one case even if it does not prepare equipment with which two signal record playback units went into one case like conventional MUBU equipment, it becomes a cheap and very practical thing.

* NOTICES *

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The block diagram showing the whole datum aconite tuber stem configuration in the gestalt 1 of operation of this invention

[Drawing 2] The flow chart of the main program of the system control section with which the equipment of the transmitting side of this system and a receiving side is equipped

[Drawing 3] With the flow chart of the MUBU processing in the system control section of the equipment of the transmitting side of this system, and a receiving side, this drawing (a) shows MUBU processing of the equipment of a transmitting side, and this drawing (b) shows MUBU processing of the equipment of a receiving side.

[Drawing 4] The explanatory view for supplementing with the interrelation at the time of the MUBU processing between each equipment of the transmitting side in this system, and a receiving side

[Drawing 5] In the explanatory view showing an example of disc data structure, the condition of the disk of the transmitting side before this drawing (a) performs MUBU, and a receiving side, and this drawing (b) show the condition of the disk of the transmitting side immediately after data transfer, and a receiving side.

[Drawing 6] In the explanatory view showing an example of disc data structure, the condition of the disk of the transmitting side after this drawing (a) completes MUBU normally, and a receiving side, and this drawing (b) show the condition of the disk of the transmitting side after terminating MUBU abnormally, and a receiving side.

[Drawing 7] The flow chart of the main program of the system control section with which each equipment of a transmitting side and a receiving side in the gestalt 2 of operation of this invention is equipped

[Drawing 8] With the flow chart of the MUBU processing in the system control section of the equipment of the transmitting side of the system of drawing 7, and a receiving side, this drawing (a) shows MUBU processing of the equipment of a transmitting side, and this drawing (b) shows MUBU processing of the equipment of a receiving side.

[Drawing 9] The block diagram showing the configuration in the case of MUBU [disk / one / disk / of another side / data] in conventional single equipment

[Drawing 10] The explanatory view showing an example of disc data structure

[Drawing 11] In the explanatory view showing an example of disc data structure, the condition of the disk of the transmitting side before this drawing (a) performs MUBU, and a receiving side, and this drawing (b) show the condition of the disk of the transmitting side after performing MUBU, and a receiving side.

[Description of Notations]

1 12 [— 5 The error correction section, 8 / — Memory, 6 / — The decryption section, 7 / — The coding section, 9 / — 13 A correction sign adjunct, 14 / — 15 The system control section, 16 / — The digital interface section, 17 / — Bus.] — 2 A disk, 11 — 3 A head, 10 — The servo section, 4

[Translation done.]